Meeting Summary
Environmental Technology Verification Pilot - Wet Weather Flow Technologies
Stormwater Treatment Technology Panel Meeting

November 13, 2001
Salt Lake City, UT

(See Attendance Record for Participants)

The meeting began with self-introductions by the attendees and a reading of the NSF International Anti-Trust Statement.

An update of the Wet Weather Flow (WWF) Pilot/ETV Program was then presented. The latest version of the Protocol was approved in March 2001 with expectations by the Technology Panel that additional details would be incorporated into the Test Plans as they were drafted. A technical review concluded that the Protocol was acceptable. Vendors have also made some additional comments and suggestions. An updated version of the Protocol will be developed shortly after this meeting.

To date, twelve storm water treatment vendors applied for verification. The devices manufactured by these vendors fall under the following technology categories: 1) Filtration systems; 2) Catch basin inserts; and 3) Hydrodynamic Separators.

Three test sites have been selected: 1) Griffin, GA., 2) St. Clair Shores, MI; and 3) St. Mary's Hospital in Green Bay, WI. Additional test sites have been proposed and are in the process of being evaluated. A summary of vendor information for all technology areas encompassed by the Wet Weather Flow Pilot including storm water was provided as a handout.

Verification Testing Status Reports which included a presentation of the activities at the various testing sites were discussed. Five events have been monitored to date Arkal filtration device at St. Mary's Hospital in Green Bay, Wisconsin. The testing planned in Griffin, Georgia will consist of evaluating devices from four vendors: Baysaver, Inc., Vortechnics, Inc., BPM, Inc. and Stormwater Management, Inc. The City of St. Clair Shores' plans for testing the Ultra-Urban filter, Hydro-Kleen, and the Storm Filter were then presented. One of the challenges to the St. Clair Shores evaluation is the difficulty of manual sampling for hydrocarbons and PAHs. An alternative suggested was auto sampling with Teflon tubing and glass containers covered with foil. NSF offered to conduct laboratory testing to insure the viability of this option, since no data is presently available on this subject. An additional concern expressed was whether EPA would allow the use of a "non-EPA approved" procedure in an EPA-sponsored project. Mary Stinson was asked to follow up on this.

Next was a discussion of Other Testing Initiatives and Protocols. ETV verification data requirements were discussed in relation to data requirements of the 6-State Program. Tom

Maguire, from the State of Massachusetts, stated that, based on his knowledge of the 6-State Program, there was a good chance the 6-State Program would accept ETV data, but ETV may not be able to accept their data. An update on the Puget Sound Protocol was then presented, including submission of a draft document entitled "Guidance for Evaluating the Performance of Stormwater Pollutant Removal Technologies (including the test protocol)" by the Washington State Department of Ecology. This was followed by a brief discussion of EvTec, including tracking in terms of progress and direction. Two cost saving measures were introduced: the possibility of collaborating with the ETV Source Water Protection Pilot for the testing of hydrocarbons (HC) as a means of reducing costs to the ETV Wet Weather Flow Pilot, and cutting down the 15 HC sampling events to five.

The possibility of using data from other sources such as the Source Water Protection Pilot was then discussed. It was stated that it was critical to insure that the integrity of the ETV Program not be compromised by the use of outside data, but that areas of testing and/or protocol coordination should be pursued with other agencies.

Several issues related to the protocol/test plans for storm water were addressed. The first was Suspended Sediment Concentration (SSC) vs. Total Suspended Solids (TSS). Naturally occurring variations in particle size distribution and variations sampling techniques can make consistent storm water influent sampling for insoluble particles difficult. The scientific community has indicated that SSC analysis may be more representative of solids content than TSS analysis, and should be added as an additional parameter. Although TSS and SSC testing should theoretically indicate the same results, samples with disproportionate number of larger particles can yield different results. The TSS method was originally developed for wastewater samples; an aliquot of sample was filtered and weighed, and solids concentration was then determined. The SSC method requires filtering the entire sample, not just the aliquot, and therefore accounts for all of the solids within the sample, and thus may yield a solids concentration higher than that measured by TSS. Additionally, correlations between TSS and SSC data may not be possible.

The difficulty of treatment units filtering smaller particles and not having them re-entrained was also discussed. It is possible to load the filters with inert sediment and not the other pollutants of concern, thus it is improper to evaluate the collection only of pollutant and not sediment in load polishing systems.

There is the option of using both the TSS and SSC data during system evaluation. TSS reporting is needed to evaluate the effectiveness of filtration systems against regulatory requirements. For example, the State of Washington mandates an 80% reduction of TSS in their standards. However, SSC may better indicate the "real world" effectiveness of the filtration systems. Also, assuming sampling and analysis are done in an appropriate manner, the verification report can discuss aspects of the testing and sampling procedure so that the user can extrapolate the usefulness of the both the TSS and SCC data for their community.

TSS is also needed to give a perspective to previously collected data until SSC is accepted as a viable testing procedure and a correlation between SSC and TSS is achieved. TSS could underestimate the benefit of the device. Conversely, use of SSC data may identify removal of larger solids but not identify the removal of the smaller insoluble materials that the system was intended to remove. An additional consideration is that TSS Standard Methodologies have changed, and utilizing different testing standards can yield different results.

Sampling techniques were also discussed as a possible area of concern. Two important considerations, insoluble solids and solids loading, need to be addressed. There are several parameters used in assessing the need of storm water filtration; for example, particle size (pretreatment required to remove particles greater than 500 micron in size) and total suspended solids. Standard Methods for TSS sampling indicates the need to remove large particles and debris, but this is not clearly defined. The use of auto samplers and variations in influent velocity can also affect solids sampling in influent.

There was a consensus to do both TSS and SSC, and the sand/silt split. If the BMP device shows no filtration for TSS, then it is not an efficient method to remove small particles. If results are better for SSC, this reflects greater removal of larger particles. The test methods for TSS and SSC need to be defined, especially for use in storm water sampling applications.

SSC Method C gives an entire cross-section or total loading, whereas TSS only gives smaller particle portion. This wet sieve method gives the sand/silt split, above and below 62µm.

An understanding of the bed load and Particle Size Distribution (PSD) would be useful to use the data across the country, since these factors drive a lot of systems.

In vs. Out compared to sampling captured sediment was next discussed. Some vendors prefer to determine total collected mass of a filtration technology. Should the protocol indicate that if there is a sump, the total collected mass should be determined? For instance, CDS Technologies doubts the ability of automatic samplers to measure what comes in.

The ability to change volume to a flow rate may be needed to account for first flush filtration phenomena, and the need to monitor bypass systems are important considerations. In a laboratory setting, Hydro International has performed verification with solids under controlled conditions with specific laboratory parameters. It is simple to obtain PSD and sample characterization in this manner. A centralized focus of data is needed to give a general idea of "the way things go."

The next topic of discussion raised was that of characterizing trash and debris and floatables. In areas such as Santa Monica, CA, the first flush is important because debris and floatables force closing of the beaches. All phases of storm water runoff, including debris and floatables, are important considerations, however, regulatory agencies may not

recognize removal of trash and floatables in storm water systems. An addendum to discuss trash-trapping devices was noted.

The panel also addressed grab sampling for TPH/PAH. In relation to Oil and Grease/TPH sampling, the following was proposed:

- Grabs, when and where practical, at a minimum frequency (3-4 storms at 3-4 aliquots/storm);
- An autosampler can be used if shake-down site tests quantifies impact of TPH adherence to equipment and mitigates or accounts for it;
- Conduct development program for applying autosamplers to sampling Oil and Grease/TPH.

Another issue raised was the fact that hydrocarbons are not addressed in the protocol, but are an important aspect of catch basin insert performance. One suggestion offered was to have a generic protocol followed by a joint protocol with the Source Water Protection pilot that would address such specifics.

In summary, the technology panel recommendations were the following:

- Require SSC as a measure of the solids load in addition to TSS, including the sand/silt split;
- Provide additional guidelines on proper use of automated samplers and sample splitting;
- Provide guidelines for characterizing trash and debris removal but do not establish removal quantification parameters;
- Study use of automated samplers in place of manual samplers for hydrocarbons;
- Supplement lab with field data where appropriate;
- Permit, but don't mandate, analysis of captured sediment/pollutants;
- Revisit some target detection limits;
- Improve guidance on sampling and lab Quality Assurance.

Attendance Record

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November 13, 2001- Salt Lake City, UT

Thomas Maguire, Massachusetts DEP
David Woelkers, Hydro Compliance Management
Pamela Deahl, Hydro International
Jim Bachuber, Earth Tech
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Roger Bannerman, Wisconsin DNR
Charles Calapa, Mass. Water Resources Authority
Kelly Williamson, AquaShield, Inc.
Lee Phillips, Integrated Science and Engineering, Inc.
Patricia Cazenas, FHA
Bryan Wigginton, Storm water Management
Annette DeMaria, Environmental Consulting and Technology, Inc.
Phyl Kimball, Ultra Tech International
Gary Lippner, CDS Technologies
Mary Stinson, USEPA/NRMRL
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